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HANDWRITING EFFICIENCY
IN JUNIOR AND SENIOR
HIGH SCHOOLS

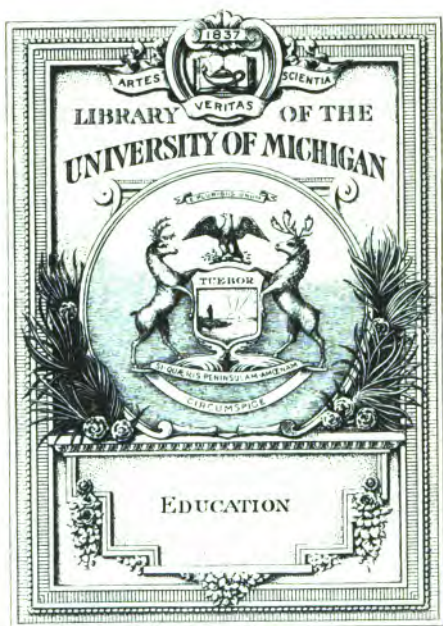
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By J. M. SNESRUD



GREGG EDUCATIONAL MONOGRAPHS



Handwriting Efficiency in Junior and Senior High Schools

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Handwriting Efficiency in Junior and Senior High Schools

THE schoolman's task is never done. Because of the fact that he deals with fundamental life processes as brought into action through the directing influence of the school, the schoolman is forced to analyze school processes constantly in the light of ever-changing social needs. It is necessary not only to adjust school activities so as to measure up to the social needs actually existing today, but also to anticipate the needs of the immediate future by directing all school progress in the line of social progress and in this way equip boys and girls with all those skills which are essential for future efficiency. Because of

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the practical importance of the school product, every increase in the demand for more efficient boys and girls is an index to the increasing importance of more exacting analysis of all school processes with a view to elimination of all lost motion and the setting up of higher standards of speed and accuracy. The efficiency expert, stop watch in hand, is typical of the modern attitude.

The schoolman has not been unmindful of genuine social demands, nor is he overlooking the present trend as an index to the higher types of efficiency justly demanded for the immediate future. Every process and every type of content in the program of study is scrutinized in the light of the most probable needs of the individual boys and girls. Non-functional content is thrust aside and lost motion is gradually being replaced by effective school processes. Physical and mental tools of every type are measured in terms of

productive effort and those which no longer serve effectively are discarded; other tools which are found to render efficient service only within limited fields are put into service in those fields only. More specifically, the actual functions of the so-called educational tools are being determined by careful experimental studies and investigations. If an educational instrument is found to possess more social value or less social value than is accorded by educational tradition, emphasis in the schoolroom is shifted in accordance with the findings. Within its sphere each instrument is made to yield standardized results with a minimum of effort.

For our purposes in this discussion we shall limit our study to the standardization process as expressed in handwriting in our schools and indicate in a general way the direction of progress in this phase of school work.

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FUNDAMENTAL ELEMENTS

Learning how to express ideas "by hand" and, moreover, applying this ability in the thinking process, is one of the fundamental elements in a sound education. Hence, every basic advance in handwriting efficiency marks an increase in rate and quality of accomplishment. Recognizing the importance of functional skill in handwriting, the school world has insisted that the very instruments used in the handwriting process must stand or fall as measured in the terms of child welfare and pupil efficiency. A survey of the history of penmanship in our country will show that every step in the development of a more effective handwriting instrument in the field of longhand, can be explained in the terms of the physical and mental make-up of the pupil. In spite of the controversies which have often confused the fundamental points

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at issue, the general line of development has been essentially as follows:

1. Attain a working posture which will conserve the health of the pupil.

2. Eliminate useless flourishes in the individual letters and reduce every stroke to effective simplicity.

3. Delegate fancy shading to the specialist's field and give the "average" child a real chance to acquire a functional standard.

4. Limit types of longhand in our schools to those which may be adjusted easily to the various grades and qualities of pencil and pen, paper and black-board.

5. Demand a clear-cut alignment which will function with ease on any handwriting surface, ruled or unruled.

6. Recognize the complexity of eye-adjustments in the reading process; hence do away with every element in the written outlines which will subject the eyes to undue strain in "reading back."

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7. Secure a high degree of elasticity, a type of elasticity which does not detract from the effectiveness of the motor processes, yet adjusts itself to the temperamental characteristics of the individual pupil.

8. Pay heed to the fundamental importance of rhythm in the handwriting movement.

9. Enhance the beauty of form on a practical basis of functional simplicity.

These, in brief, are some of the more important factors which have directed the development of near-standardized elements of longhand in schools. These factors also serve in a large measure as a practical criterion in measuring the functional possibilities of longhand in actual service.

STANDARDS OF SPEED AND LEGIBILITY

Looking, for the time being, at the standards of speed and legibility set up for longhand in our schools, it will be

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of practical interest to measure the actual accomplishments in the light of social needs. Results as tabulated by investigators tend to show that it is possible for all normal boys and girls to acquire a functional standard of skill — and that, on the basis of 30-40 letters per minute in the lower grades, each pupil, upon leaving the sixth grade, should be able to write 60 letters per minute measuring up to a quality of 50 on the Ayers' handwriting scale. Our only specific aims in the seventh and eighth grades are to increase precision and speed. Investigators find that it is possible to increase the rate to 90 letters per minute without sacrificing the essentials of quality. A rate of 100 letters per minute is a full measure of the practical speed possibilities of long-hand. In fact this maximum has not been reached by our schools. Mr. E. E. Lewis reports a median rate of 90 letters per minute for pupils in 156

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normal training departments in Iowa high schools. This median is undoubtedly high, due to the fact that the pupils in question were preparing for a vocation in which longhand skill is very important. If the speed possibilities of longhand are expressed in the term "word units," taking five letters per word as an approximate average in contextual writing, we find that our entire range is limited to 12-20 words per minute. Now, assuming that the maximum of twenty words per minute could be reached and maintained in the handwriting activities of the school and in adult life, — is such a highly desirable, but as yet unrealized standard a full measure of our needs?

A few random illustrations will show the relation:

(a) Take a typical "question and answer" recitation with intermittent writing on the blackboard by the teacher, or on either paper or black-

board by the pupils. The average word rate in the oral discussion is in the neighborhood of 100 words per minute. In the oral process the teacher and pupil are forced to shift at short intervals to a handwriting rate of 12-15 words per minute. Usually the written product is far from being satisfactory. But another phase of this situation is of even greater consequence. Such sharp, non-functional adjustments in the teaching-learning process are far more disastrous to vigorous and effective mental work than we as yet suspect. Any attempt to harmonize the two rates by pushing the speed in longhand beyond its normal limits is disastrous to both the oral discussion and the serviceability of the written product.

(b) We assign a lesson in history. The pupil is urged to make careful and comprehensive notes of all important facts, and, in some instances, outline the problem under discussion. We also

direct the attention of the pupil to the importance of getting at the reasoning of the assignment as quickly and clearly as possible. We demand improvement in both rate and comprehension in silent reading while the pupil is engaged in wielding a writing instrument recording 12-15 words per minute. How does this handwriting rate tally with the silent reading rate expected of our pupils? The usual silent reading rate is, approximately 100-300 words per minute. It would be highly interesting and profitable to analyze the mental activities called forth in such a strained situation. How many times per day is the teacher or pupil forced to leap from, say, 200 words in silent reading to, say, 15 in writing?

(c) Our pupils are "sent to the board" to do speedy work in arithmetic, algebra and geometry. In developing problems there is a constant shifting from mathematical symbols to longhand let-

ters as embodied in words. The pupil is warned to keep his mind on the reasoning of the problem and work rapidly. Determination of the time actually consumed in the purely mechanical process of writing the longhand words in the development of a geometric problem, for instance, will localize one of the leaks in our school systems.

(d) Every pupil likes to hear an interesting story. A class is absorbed. The teacher remarks: "We have had a delightful time today. You have surely had other interesting experiences you would like to tell us about. Now, won't you tell us a story tomorrow by writing it out on paper?" Some pupils pretend to enjoy the performance, or, at any rate, the teacher often attaches ideas of functional pleasure to such an assignment. However, the actual experience of the average junior or senior high school student is worth analyzing in greater detail than has been our prac-

tice in the past. In the vain effort to harmonize his mental rate and the expressional rate of his writing instrument, the pupil jolts and stumbles along. To be sure, a writing instrument fitted for the specific task at hand does not insure a thoughtful development of the composition, but it is reasonable to believe that a writing instrument out of harmony with the rate of the mental processes produces a more serious check to the pupil's degree of effectiveness in organizing and expressing ideas connectedly than is apparent on the surface.

(e) Examinations. If it were possible to determine what proportion of the time used in a school test or examination is drawn from the higher mental processes to the purely mechanical effort of speeding up the longhand writing instrument, we would undoubtedly revise our standards for such assignments quite thoroughly. A careful study of time relations in any set of papers will

show that qualities ascribed to ignorance, mental slowness, or inactivity are to a large extent the direct result of a writing rate arbitrarily limited to 20 words per minute.

(f) Discussions and debates are important sources of school training. Our pupils are directed to magazines, pamphlets, newspapers, and reference books for data. Extensive card files or other forms of notes are prepared. In the trials and actual debates the students are urged to make every second count, especially in the rebuttal. The precise facts and statements presented by the opposition must be written down carefully while the attention is fixed continually on the speaker. If it were possible to eliminate 80% of the mechanical labor involved in writing notes for debates and similar activities, how would the changed condition react on the pupils' interest in such vital types of training?

These are mere random illustrations, but they are typical of the daily work and activities of pupils in junior and senior high schools. The writer asserts that if all our school processes were analyzed along the line suggested, long-hand would be seen to function inefficiently in at least 75% of the written work in the school.

SOCIAL NEEDS

However, this situation is merely a reflection of social needs in adult life. The truth of this statement is suggested by the following illustrative situations:

(a) In all efficiency studies the commonplace operations are the most important. Take the simple but common case of the home manager placing an order for groceries or other supplies by phone. While no special studies have been made of this brief but everyday situation, it is apparent that a handwriting instrument suited for the quick

exchanges would increase the efficiency of both clerk and purchaser.

(b) In the course of social development, committee meetings come within the experience of nearly every person. A handwriting rate fully expressive of the normal oral rate is not available at the present time.

(c) A meeting of the Farmers' Club or Commercial Club. . . . Valuable facts are presented, important facts of practical significance arise in the discussion, but very little is possible in the way of notes or memoranda. A simple but rapid writing instrument would put into serviceable form every point of value brought to the attention of each member.

(d) The remark is frequently heard: "I like to get letters but I do not like to write. Somehow I cannot get down to writing." True enough several elements enter into this attitude, but a person labors under severe handicaps in

the effort of harmonizing two widely divergent rates of travel. The thoughts of the message are cut into fragments by the mechanical process.

(e) Careful investigations show that lawyers, preachers, and doctors maintain a lower standard of writing under the stress of affairs than workers in other vocations. It is a case of "getting there" under impossible handicaps. The unstandardized abbreviations and illegible scrawl ordinarily coming from the hand of the professional man are a striking illustration of the finished product of a type of penmanship which, though very efficient in its own field, fails to "get across" in other fields.

(f) Recording secretaries are important officers in our societies and clubs. We have tens of thousands of them. If, by the adoption and use of a penmanship instrument specifically fitted for the work of such officers, the me-

chanical labor were reduced 75%, what would be the effect on the elimination of inefficiency in our group activities?

(g) Our whole social situation is developing into a continuation school for men and women, young and old. Opportunities for advancement are brought within the reach of all vocations and all classes. Efficient writing instruments for the varied needs, not alone of persons who enter technical schools upon leaving the junior high school or who continue school work in normals, colleges, and universities after graduating from senior high schools, but for the millions who climb on and on to higher things while at work in the manifold vocations of life, will serve as vital factors in general progress.

**HANDWRITING FROM THE STAND-
POINT OF TIME**

These observations from school and adult life indicate, in a general way at

least, that any advance in penmanship efficiency which makes possible a close approximation to actual needs is highly desirable. It is not necessary, however, to base steps for improvement on general illustrations alone. It is highly important to know in a more precise way how large a part is played by handwriting from the standpoint of time. As a basis for quantitative comparisons, I submit the following data: Through a preliminary investigation conducted by the writer in three Minnesota high schools, approximately 100 pupils in grades 7-12 (and teachers for the same grades) were provided with tabulation sheets and instructed to keep a daily record of every minute of time used for written work (on paper or blackboard) during a typical school week. Class work in longhand penmanship was not included, but written work connected with home study and school societies was made a part of the record. While

this investigation does not give evidence of detailed accuracy, general tabulations show that a pupil in the junior or senior high school spends approximately 100 minutes per school day in the hand-writing process, not including class exercises in longhand penmanship. Each teacher for the same grades uses about 60 minutes per school day, one-half of which is spent at the blackboard. Granting the limited scope of this preliminary investigation, facts nevertheless indicate that in analyzing the hand-writing efficiency of pupils in junior and senior high schools, we are measuring a phase of school work which consumes 120 minutes per pupil per school day, or 10 hours per week. It is reasonable to assume in this connection that the average rate of writing during the two hours per school day was not more than fifteen words per minute in view of findings presented earlier in the discussion. If it were possible to extend the

study to the total amount of written work from the standpoint of quality of handwriting and the quality of the thought processes as affected by the arbitrary limitations of the writing instrument, we should add another evidence of handwriting inefficiency in our schools. These facts taken together do not prove in any way that longhand will cease to be an important phase of handwriting in our schools; longhand penmanship will undoubtedly continue to give real and lasting service in our schools and adult life. However, the truth of the statement just made does not preclude the fact that if, say, one-half (one hour per day) could be saved by extending our penmanship training to include shorthand as well as longhand, we have before us the possibility of locating and eliminating the most striking element of inefficiency (through lost motion) now existing in our schools. It remains

to be proved by actual "doing" that it can be done. In this paper an attempt is made merely to show how the problem may be *approached*.

A saving of five working hours per week, coupled with increased efficiency in the work actually done, is an inviting prospect for a schoolman bewildered by congested programs of study. As a superintendent, the writer is face to face with this common problem and is vitally interested in practical readjustments making for economy of time and efficiency of effort.

COMMON BASIS FOR SHORTHAND
AND LONGHAND

It is apparent at the outset that the only way to approach the problem is through a reorganization of the fundamental elements of penmanship so as to provide, if possible, a common basis for shorthand and longhand as complementary phases of a single handwriting

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art. As such the task is merely one phase of a general problem which is claiming the attention of schoolmen at the present time. We are in the midst of a fundamental reorganization of the content of our school courses and also a resulting rearrangement of programs of study, in order to bring about a more satisfactory articulation of school units and a more basic correlation of subjects. The whole trend is in the direction of general courses of a broad, fundamental nature for the junior high school. Accordingly, we are bringing into seventh and eighth grades types of training and instruction which have been limited to school curriculum. Elements from botany, physical geography, physics, etc., are being resolved into graded general science courses for *all* junior high school pupils. Disjointed courses in mathematics are passing through a process of evaluation, and elements of universal value are organized into com-

posite constants. The same tendency is at work in the social sciences and other fields. In the whole process, one of the decisive tests of the fitness of any type of skill or learning for junior high school pupils is the universality of its value and the possibility of weaving it into some general course of instruction. The elements must rest on a common basis and make possible a natural progression up through the junior and senior high schools. Applying the test to penmanship, it is important to observe that the practicability of extending and perfecting the efficiency of handwriting through a general course for all junior high school pupils to meet the needs outlined earlier in the discussion, will depend very largely on the possibility of finding shorthand elements of penmanship which rest on the same physical and psychological basis as long-hand, hence forming a close relationship on a common ground on which the pupil

may turn from the use of one instrument to the use of another more fitted for the specific task at hand.

We quite naturally turn to longhand penmanship in the lower grades to find the basic elements of handwriting. Any general course in penmanship for junior high schools is practical only in the measure that it builds on the foundation formed in the first six grades. Early in our study, attention was called to the fundamental factors which have directed the growth of a functional type of longhand penmanship in the lower grades. The basic elements of longhand as now taught and used are an outgrowth of the physical and psychological characteristics of school children and it is reasonable to assume that the fundamentals of movement and form closely approximate those most desirable for longhand efficiency. At this point it is worth while to notice that longhand penmanship actually found in our

schools is rapidly reaching uniformity and standardization by almost universal adoption of the "Palmer Method." Statistical records for the nation are very incomplete as yet, but it is apparent that the "Palmer" is now used in more than 80% of our schools. It is not our purpose to discuss the problem of penmanship reorganization from the standpoint of any particular shorthand or longhand penmanship system, but we venture the opinion that this standardization is a direct result of the meeting of fundamental needs, and that as a practical problem of correlation whatever fundamental characteristics are found in the "Palmer" will apply in all our schools in the near future. Following this explanation, we shall use the term "Palmer" as a representative of longhand elements of penmanship.

The practical proposition before us, then, is this: Is it possible to find shorthand elements of penmanship which

rest on the same motor basis as the Palmer and which, by virtue of this close relation, may be woven into a general penmanship course, and through the service of which the hours now wasted in our schools may be saved and turned to effective use? In fact, merely finding a type of shorthand penmanship suited for this effective correlation is not enough. Unless it is used extensively in our schools, or at any rate shows indications of extensive adoption in the near future, a theoretical reorganization, however attractive, would serve no practical needs in our schools *as they are*, or as they are likely to develop in the immediate future.

STATUS OF SHORTHAND IN THE
HIGH SCHOOLS

Accurate shorthand statistics are, fortunately, available. In the Journal of the National Education Association, February, 1919, Mr. David H. O'Keefe

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presents the following summary for high schools:

NUMBER OF SCHOOLS

1884		1893	
Graham.....	2	Benn Pitman.....	17
Isaac Pitman.....	2	Munson.....	10
Munson.....	2	Isaac Pitman.....	5
Longley.....	2	Cross.....	4
Benn Pitman.....	1	Lindsley.....	4
Lindsley.....	1	Scott-Browns.....	2
	—	Pernin.....	2
Total.....	10	Allen.....	1
		Total.....	45

1918

Gregg.....	1524*
Benn Pitman.....	189
Isaac Pitman.....	60
Graham.....	44
Munson.....	22
Barnes.....	20
Chandler.....	19
Anderson.....	5
New Rapid.....	4
Paragon.....	4
Stenotype.....	4
Others (two-thirds Pitmanic).....	125
Total.....	2020

* January 1, 1921, Gregg Shorthand was taught exclusively in the high schools of 3593 cities and towns, a percentage of 82.62.

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The following summary represents the total number of schools of all types in the United States teaching shorthand:

NUMBER OF SCHOOLS			
1884		1893	1918
Gregg.....	0	0	2163
Benn Pitman	77	536	335
Isaac Pitman	28	122	121
Graham....	17	183	117
Stenotype...	0	0	51
Munson....	34	143	40
Barnes.....	0	0	30
Chandler...	0	0	19
Pernin.....	0	49	14
Others.....	<u>107</u>	<u>518</u>	<u>331</u>
Total.....	263	1551	3221

A close study of the two tables shows that the rapidly approaching standardization noticed in the field of longhand is also found in shorthand. The Gregg, which is not represented at all in 1893, is used in more than 75% of shorthand departments in public high schools reported, and in more than 67% of all schools reported as teaching shorthand. According to the most recent figures, the

Gregg is now taught in 87% of all schools teaching shorthand in our country. It is also worth while to note the significant fact that the Palmer and Gregg systems are gaining in practically the same ratio and represent in each case more than four-fifths of all penmanship adoptions in their respective fields. It is possible that these types of handwriting are not "the last word." Nevertheless, from a practical point of view, this striking standardization process determines for us the kind of penmanship elements available for use in a general course for junior high schools. Moreover, in view of modern demands for efficiency, it is safe to assume that the basic factors which have directed the progress in long-hand have been given expression in a similar way and to a like extent in the Gregg type of shorthand. Apparently, the answer is found in the inherent characteristics common to both and exemplified by both in actual operation.

**COMPARATIVE STUDY OF SHORTHAND
AND LONGHAND**

We turn to a comparative study:

1. The Palmer has come into general use largely because it gives heed to the physical and mental make-up of the pupil. The Gregg has been evolved on the same basis. The skills in both are acquired in harmony with the natural physical development of the child and adolescent; the type of posture and forms of movement are identical, as will appear in analytic outlines presently. Whatever is necessary for the preservation of health and for guidance in physical development will serve directly in building up shorthand and longhand writing skill.

2. Economy of movement due to simplicity of form is a common characteristic. The slant is similar, useless curves are absent, angles are reduced to a minimum, every lift of the pen is a

direct step forward to the succeeding character — all very important factors in penmanship economy.

3. The lines are even and light in both Palmer and Gregg, thus making possible an easy shifting from longhand to shorthand, or vice versa.

4. The Palmer adjusts itself easily to any reasonable writing surface and writing tool. The Gregg is equally efficient in these respects. Gregg shorthand will function on any grade of paper now used in our schools and will respond with ease on all standard grades of blackboard.

5. For handwriting purposes it is not always practical to use ruled surfaces, especially in mathematics. Gregg shorthand can be written and read with the same ease and efficiency on unruled paper or blackboard as longhand. It is a "one position" type of shorthand penmanship — a very vital consideration for school purposes.

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6. Undue eyestrain is indefensible in any fundamental educational instrument. The outlines in Palmer are clear-cut and stand out sharply on paper and blackboard. A searching test will reveal similar qualities in Gregg.

7. Both the Gregg and Palmer can be moulded to express the temperamental characteristics of the individual as exemplified in adjustment of slant, size of characters, the thickness of the line and other elements. There is flexibility throughout.

8. Natural rhythm and "beautiful simplicity" are found in both.

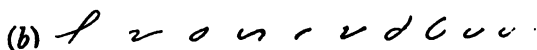
COMPARISON OF LONGHAND WITH SHORTHAND

Thus far our analysis has been limited to facts of general observation. An objective statement of inherent similarities of form is now presented. One line represents the longhand letters of the

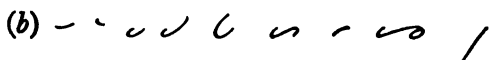
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word "handwriting" reduced to constituent elements. The illustration is taken from Dr. Freeman's Monograph, "The Handwriting Movement," and is found on page 33. The other line given in this statement represents common shorthand forms used in Gregg. "Which is which" in this illustration?

(a) 

(b) 

(a) 

(b) 

Note that this illustration is not presented to show that similar strokes convey precisely the same meaning in both Palmer and Gregg. Clearly this is an impossibility, since several motor ele-

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ments are needed to express a single, longhand letter. Attention is merely called to the fact that the underlying motor basis is identical. The difference is merely in the number of strokes used to express a given sentence in contextual writing.

Now, what is this difference in the number of strokes in Palmer and Gregg? A somewhat careful and extensive analytic study by the writer reveals the following facts: In any given paragraph the approximate ratio of strokes is five and one-half to one (5.5-1). In spite of the reduction of necessary strokes to less than one-fifth in shorthand, there is no apparent increase in the difficulty of individual strokes or in joining the successive strokes in continuous writing. Lifts of the pen are more numerous in shorthand, but apparently this factor is offset to a large extent by the pauses occurring in forming the individual longhand letters.

HOW AN INCREASE IN HANDWRITING
EFFICIENCY MAY BE GAINED

In view of the facts presented in this comparative study, the writer believes that unsuspected increase in handwriting efficiency in our junior and senior high schools may be gained by the following plan:

(a) Organize a general course in penmanship for junior high schools.

(b) Build the course as a natural continuation of the basic elements of handwriting developed in the first six grades. Organize and present exercises in which the fundamental motor habits acquired for longhand may be extended on the same motor basis into shorthand. Parts of the various drills and exercises, if organized well, will maintain and improve precision and rate in longhand, while other parts of the same lessons may be used to carry the fundamental motor elements already acquired over

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into fundamental movements in shorthand.

(c) Organize all exercises with the object of using longhand in 25 %, and shorthand in 75 %, of all written work on paper and blackboard by all pupils in the junior and senior high schools.

(d) Conduct classes twenty (20) minutes per day, five days per week in grades seven, eight, and nine. The time now used for longhand in grades seven and eight is included in this schedule. No special class work required beyond the ninth grade.

(e) Stress reading of shorthand, especially the first few weeks in the seventh grade.

PSYCHOLOGICAL BARRIERS OVERCOME

This general outline is merely a skeleton plan. Nevertheless, three very important psychological barriers appear and, unless these are surmountable, there is no practical working basis. We

shall proceed to an analysis of each one to find our bearings.

1. The plan is impractical if it forces a sharp break in the development of handwriting motor skills. It is important to know at this point just what relation there is in longhand between finger and arm movements in actual writing in our schools. Dr. V. N. Freeman, quoting from "The Handwriting Movement," found a ratio of approximately one-third finger movement and two-thirds arm movement in typical writing exercises subjected to a careful analytic study by means of special instruments in the psychological laboratory of the University of Chicago. Both adults and children served as subjects. Writers of varying degrees of efficiency from poor to excellent were tested. It was found that the ratio of finger and arm movement between good and poor writers varied only slightly. Moreover, it appears that no sharp line

can be drawn between finger and arm movement in the writing process. There is a close and mutual adjustment to meet the rapidly shifting needs in forming the elements of longhand. As far as the writer is aware, no scientific analysis of shorthand has ever been made to determine whether or not the same facts apply in forming the elements in that field, but every fact to which our attention was called in our general analysis of the similarities of structure in Gregg and Palmer is an indirect evidence, at least, of a common motor basis. Hence it is very probable that no sharp break will appear in the development of motor habits by extending the scope of motor skills in handwriting to include shorthand as well as longhand, beginning in the seventh grade.

2. Granting the absence of any difficulty from the standpoint of motor habits, it is possible that objection is

raised because of inherent complexities in a shorthand system of penmanship. It is held that functional skill cannot be acquired by the average junior high school pupil. At any rate it is said that it will be impossible to maintain progress in longhand and also build up effective skill in shorthand in the twenty-minute periods suggested. It is true that a new set of symbols is pressed into service even though the motor basis is identical. However, it is important to note that the Gregg system is guided by definite principles and that the outlines are standardized in harmony with these principles. Again, viewed from the standpoint of mental processes, learning to attach meanings to a set of literal symbols comes mainly by *reading*. If shorthand is put before the eyes of the pupil in daily exercises in the various classes, reinforced by special emphasis on shorthand reading in the seventh grade, the difficulties now experienced

in recognizing the specific meanings of specific shorthand symbols will disappear and no serious obstacles from this source should hinder rapid progress.

3. The importance of efficient silent reading habits is given increased recognition in our schools. It is of vital importance to find out whether or not the acquisition of effective silent reading habits of a desirable type for shorthand symbols will in any way interfere with normal progress in other types of reading, e.g. from the printed page. Eye adjustments in particular are a prime factor in reading. What is the precise relation between motor adjustments of the eyes in reading shorthand and in reading by means of other kinds of symbols? . . . Just what this relation is we do not know. No experimental studies have been made in this field. For the present we are obliged to limit our inferences to scientific data gathered in a careful, analytic study of eye move-

ments in the reading of books printed in ordinary type. Dr. Gray, Dr. Schmidt, and Dr. Judd have done experimental work which furnishes facts and conclusions of importance in getting our bearings on the phase of our problem receiving our attention just now. In this discussion it will be impossible to give a detailed review of the findings. We shall merely summarize those facts which apply most directly to our present analysis:

(a) From the standpoint of eye movements, most of the time consumed in reading is spent at the fixation points. Every pause of the eye is followed by a series of special adjustments. The eye strained to make extensive movements so as to fit the precise kind of sensory material put before it as objective guide in reading. The travel between fixation points, however, is very rapid.

(b) Experiments were conducted in changing directly from eleven point to

twenty point type. No appreciable increase in eyestrain was evident, either at the fixation point, or in moving from fixation to fixation.

(c) In the light of facts gleaned from the experimental work referred to, Dr. Judd concludes that motor habits of the eyes are specific for each type of symbols, but that a shifting of sensory material gives no evidence of difficulty in adjustments. On page 53 in his monograph, "Reading, Its Nature and Development," we find the following statement; "The unit of recognition in reading is very little affected by changes in sensory content. Recognition depends on the training of the individual. Only slight differences in fixation appear when the type is enlarged or when it is reduced within wide limits." On page 35 we find this significant conclusion, "The sensory conditions of reading are of less importance than the established habit of recognition."

In the absence of experimental data covering motor movements of the eyes in reading shorthand, or in shifting from print to shorthand and vice versa, we are limited to inferences from the findings in the study just quoted. It is not improbable, however, that a specific set of eye adjustments appears in learning and reading shorthand, but that the acquisition of these motor habits will not retard or check progress in reading other kinds of symbols.

MINOR FACTORS

Several minor psychological factors play a part in the development of coordinated handwriting skill, but no evidence is at hand to show that they play a determining rôle one way or the other. For this reason we are reasonably safe in concluding that the review of basic factors just given is sufficient indication of the absence of psychological barriers

to a workable general course in handwriting for junior high schools as outlined. Unless experimental studies, which, of course, are essential before we can proceed to reorganize on a scientific basis, reveal unforeseen difficulties, the writer is unable to find any fundamental obstacles in the way to hinder the development of functional motor habits for both shorthand and longhand as complementary process in handwriting efficiency.

The man who is averse to any change says:

1. "But is it really possible to do anything about it?" This is a pertinent question, but it does not bring us nearer the solution of our problem. Scientific investigations are needed to determine whether or not the facts which have been indicated "in the rough" in this discussion are wholly accurate.

2. "But supposing the step is desirable, how are we ever going to increase

the time for training in fundamental educational instruments in a program of study which is already dangerously overcrowded?" The answer is this: We shall never be able to retain or make place for some of the other highly desirable things for the junior high school and senior high school pupils unless we eliminate the large amount of lost motion in our school processes. Shorthand will not only make a place for itself, but will open up time for other subjects as well. The ratio between strokes in longhand and shorthand is the key to this elimination of wasted effort and saving of precious time. A minimum shorthand standard of 75 words per minute for all pupils in the junior high school and 100 words per minute in the senior high school is a practical demand and can be maintained with less difficulty than a corresponding longhand standard of 12-20 words per minute.

3. "But, what is the use of speed if the pupil himself cannot read his own writing as soon as it is written?" A practical question, to be sure. It is a highly useful question to apply even to the longhand writing products we are now getting in our schools. A considerable portion of our longhand renders questionable service as a guide in reading; it is ready for the "writing hospital." But this does not answer the question. It is true that many strange things happen in "reading back" the present shorthand products in our schools, but it is surprising that pupils are able to read at all, in view of the fact that they are seldom trained in this specific process. A person learns to read by reading — by reading not only his own notes, but pamphlets, shorthand magazines, stories, business letters, classics and, above all, the writing products of classmates. A very large proportion of the skill in longhand is ac-

quired through the general reading situation in the grades. The pupils learn to attach specific meanings by ceaseless, incidental (often undirected) reading practice interwoven with the writing process. From the standpoint of shorthand it is merely a matter of applying the same general principles in the junior high school to the building up of meanings which can be recalled instantly when the pupil is called upon to exercise proficiency in reading. Sometimes efficient reading is limited only by the legibility of the writing, but usually not. A background of clear-cut meanings is built up largely by "unconscious absorption."

4. "But, we have no suitable material." Yes, we have some, but not a great deal, yet. This is undoubtedly true of all courses now being organized for junior high schools. The Gregg and Palmer manuals are, perhaps, as well organized as any textbooks now used in

our high schools, but they were not prepared for use in a general course in penmanship in junior high schools. A suitable textbook will no doubt appear if schoolmen make known a demand for it. As a sample of supplementary material, the little book, "Graded Readings in Shorthand," by Miss Alice Hunter, is a step in the right direction. It will serve splendidly for junior high school pupils. Several valuable booklets are already available. As far as the writer can see, there is nothing to hinder giving the pupil a chance to look through "shorthand windows" as well as "windows of print" when browsing in the rich field of reading material now put in the way of the pupil. At least one-third of the total could be printed in shorthand without in any way interfering with other important considerations in the school process. Even the fact that shorthand booklets of a given kind cost 50% more than similar book-

lets printed in ordinary type should not cause us to hesitate to act on this suggestion. In the first place, the investment involved represents only a small fraction of one per cent of total school costs. In the second place, the investment will bring large dividends in the form of valuable time saved each day and made available for other school work.

5. "But, our teachers do not know shorthand!" It is true that very few teachers in our country are able to take up this type of work immediately. The line of development suggested in this discussion cannot be realized in a fortnight. It may take a score of years to establish satisfactory standards and standardized practices throughout the country, but if educational leaders who are charged with the responsibility of training teachers for our schools come to appreciate the far-reaching advantages accruing from the mastery of shorthand

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as a fundamental educational instrument, the teachers will be quick to respond. Once the true situation is made clear, they will be in a better position to appreciate the value of time-saving skills than any other workers in the school field.

6. "But, the pupils will not use shorthand after they leave school, so what's the use?" It is a case of social pressure here as in other fields of learning. The social needs served by a valuable instrument, handled with practical efficiency by every person, will provide all the stimulus required. Of course this will not operate fully at first but the pressure will be accumulative and will soon take care of the whole social situation.

RECAPITULATION OF DISCUSSION

In summarizing our discussion, we are led to conclude that neither theoretical nor practical difficulties should cause

us to hesitate in arriving at a workable plan which can be put into actual operation in our schools. On the one hand, we need careful planning and gradual adjustment; on the other hand, the importance of the step calls for vigorous action. If it is our purpose to guide our schools into effective service to "all the children of all the people," our plans should include all those elements of training which will cause the mental processes to function most effectively. If we are anxious to create a school atmosphere which will retain pupils who now leave our schools needlessly, we can realize our object in part by cutting out all forms of useless mechanical drudgery. If we aim to economize time, we would do well to lay our hands on those processes which waste our precious time by the hour every week. If it is our purpose to improve classroom teaching, then let us put into the hands of every teacher every

